this technique has the potential to give us the most detailed view of the initial conditions of our universe. It will also tell us when and how early galaxies reionized the universe. Perhaps inevitably, some current topics in this fast-moving research field receive only limited coverage. Whereas Loeb describes the detectability of the direct radiation from early sources, he omits mention of the integrated background light from these sources and the statistics of its fluctuations. There have been a number of claims of detections of these effects, including a recent study with the AKARI satellite (3). Some astronomers hope to find nucleosynthetic fingerprints of the first supernovae from the abundance patterns of elements dusted in the atmospheres of old, very metal-poor galactic stars (4), and this complementary approach of cosmic archaeology deserves more discussion. Despite such omissions, readers will find How Did the First Stars and Galaxies Form? a lucid introduction to an exciting research field that is set to flourish in the next decades.

References:

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SCIENCE AND THE LAW

Power and Pitfalls of DNA Profiling
Carole McCartney

Despite the first use of DNA profiling in a criminal investigation back in 1985, until very recently a search of any respectable library catalog for books on forensic DNA would have returned the unsatisfactory "no matching results." Fast-forward to 2010, and there are now, inter alia, scientific texts on forensic genetic testing, historical treatments, sociological and sociolegal examinations, and guides for scientifically illiterate lawyers. In The Double Helix and the Law of Evidence, David Kaye considers all of these angles. He describes the book as "part history, part legal analysis, part popular science, and part applied statistics."

The author intends the book to be the first of a pair on forensic DNA profiling. Nevertheless, this first text is itself quite comprehensive. Kaye (a law professor at Pennsylvania State University) begins his account in "pre-DNA" times, with a detailed discussion of the use of genetic markers (popularly known as blood grouping). After exploring early forensic uses of DNA data, he takes the reader diligently through the "DNA wars" to arrive at current developments and scientific advances. Along the way, Kaye chronicles the "scientific egos, journalistic hype, lawyerly maneuvering, and judicial doctrine and disposition," ensuring that the reader is never left for long in the depths of scientific or statistical exposition. The scope of Kaye's analysis, his insightful and meticulous eye for detail, the coverage of both law and science (not forgetting the math), and the embrace by filmmakers and television producers is no lesser here or by Kaye, who steers clear of indulging in the hype that has surrounded DNA profiling. He does, however, defend it as a profoundly valuable tool for investigators, if used with diligence: "industrial-strength quality control is not too much to demand." Yet in order to benefit from the power of DNA, the criminal justice system must be able to harness it.

Throughout the book, Kaye highlights idiosyncrasies of DNA that mean that the potential for misunderstanding and misuse are always present. For example, juries can give DNA undue weight, an issue that needs to be better understood before it can be overcome—and overcome it must be if flawed analyses of DNA data are not to lead to wrongful convictions. This is a systemic issue: "the system might have failed, as it too often does, because of the inadequacies of its participants." One of the root causes of such inadequacies lies in the lack of dialogue among legal, science, and criminal-justice professionals. Language receives much of the blame for this failure to exchange ideas, as scientists, lawyers, and law enforcement officials each have their own vernacular. The work of Kaye goes some way to demonstrate that the barriers to communication can be breached. Doing so may require some initially discomfitting forays into other disciplines, departures from comfort zones, and patience, but it is essential.

If we are to realize the full forensic potential of DNA to improve detection rates, convict the guilty, and exculpate the innocent, then everyone involved in the use of DNA profiling needs a proper appreciation of the technology's history, strengths, and weaknesses. This is what The Double Helix and the Law of Evidence provides. I look forward to the next installment and hope that Kaye turns his attention to a global consideration of the forensic use of DNA (taking in more than just the United States). For the present, may the book get the wide readership it deserves.

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The Double Helix and the Law of Evidence by David H. Kaye